



SOLAR ROCKS

Snapshot #2 Presentation

OUR MISSION

To determine the feasibility of storing solar energy inside mine-waste rock. We will design and construct a testing chamber with temperature and pressure sensors to run various experiments.

OUR TEAM

Team Members: Emily Kliwer, Jakob Hemphill

Team Advisor: Rezaie Benhaz

Team Client: Ray Donelick

Team Graduate Mentor: Austin Anderson

Team Shop Mentor: Melissa Bogert

SOLAR COLLECTION REDESIGN

Our previous ideas utilized a solar collection device. However due to budget constraints the solar collection method will not be possible.

SYSTEM DESIGN

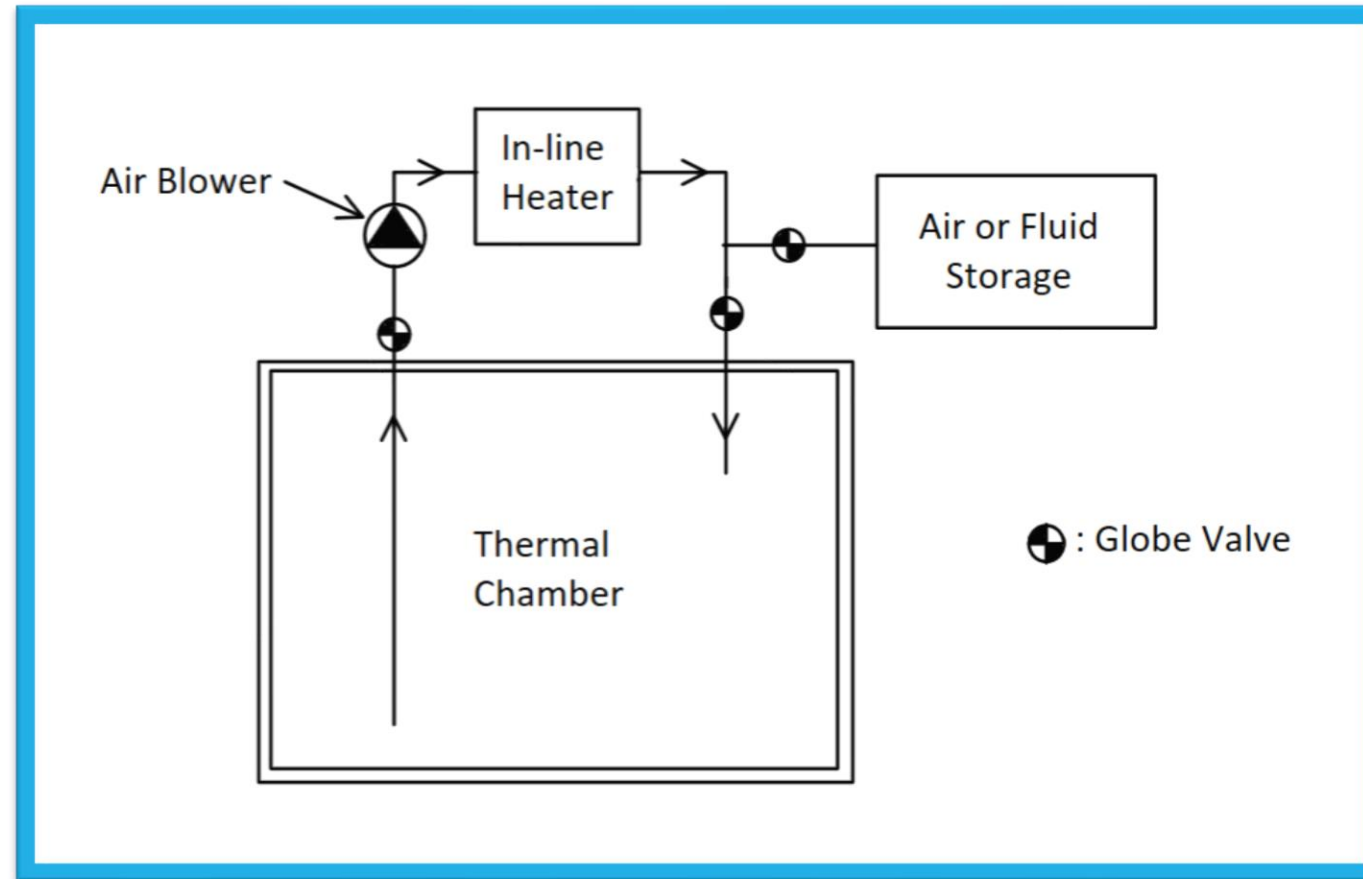


Figure 1.

WORKING FLUIDS

Fluid	Pros	Cons	Cost
CO ₂	<ul style="list-style-type: none">• Environmentally friendly.• Abundant.• Putting a problem to use.	<ul style="list-style-type: none">• Less efficient.• Requires airtight seals on piping.• Dangerous if large quantities leak.	\$20/Ton
Air	<ul style="list-style-type: none">• Free to use.• Abundant.• Harmless.	<ul style="list-style-type: none">• Requires a compressor to store air and change pressure.• Requires airtight seals on piping.	Free

Table 1.

THERMAL CHAMBER DESIGN

Our current idea is to reuse a propane cylinder as a storage tank for the mining rock.

- Easily modifiable
- Relatively inexpensive
- Insulation can be added to achieve realistic properties

HEATING SYSTEM

We wish to utilize an in-line heating system.

- Heats the working fluid to $\sim 600^{\circ}\text{F}$
- Costs are within budget $\sim \$200\text{-}300$
- Runs on 240 Volt electricity.

AIR BLOWER

We have not specified an air blower at the moment, but have a general idea of the requirements of the air blower.

- Variable speed is required to change mass flow rate.
- Able to withstand temperatures of 600 °F